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The Dilemma of Chronic Health Condition with a Focus on Polycystic Kidney Disease (PCKD) and Covid-19 in the Afghanistan Context

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Abstract: Coronavirus (COVID-19) is a relatively new disease that has hampered the whole world in terms of economy and has also created health crises in developed and developing countries. There are efforts made by various health institutions such as the center for disease control and prevention (CDCs) and John Hopkins in The risk factors, and it has been concluded that the mode of transmission is invisible. People with previous severe health conditions, older adults such as more aged than 65 years or people who have chronic medical conditions or genetically inherited kidney diseases such as polycystic kidney diseases (PCKD), lung diseases such as Asthma, hypertension, diabetes, chronic respiratory Disease, cancer heart related medical conditions and immune-deficient people and people who are on immune-related medications and addictions are more prone and vulnerable to being affected by Covid-19. Long terms immune systems or chronic diseases make the immune system weaker, which means that there is less possibility to fight or stop the viruses and bacteria entering into the body. The Covid-19has caused an increase in stress and anxiety; it is the modern medicine that proves that there is a direct relationship between stress and anxiety and disease pathogenesis. The patients with the chronic kindly Disease could be affected by Covid-19by various means such as clots made by Covid-19, lowering the oxygen level in the blood and by inflammatory response circulatory cells such as cytokines to the pathogens in the body. The medical practitioners and health care workers area greed on social distancing and non-essential physical contact at 1st place and keep an eye on the standard parameters and medications for precautions such as some water-soluble vitamins since Coronavirus can affect every human being equally regardless of gender and class. The transmission rate for Covid-19(R0), which is the ability to infect new people, is between 1.5 to 3.5 estimated by various studies. The Case fatality rate or CFR which is the percentage of the results in death (deaths/ (deaths+ recoveries)estimated by World health organization was 2% which turned to be is 3.4% in march 2020,and the CFR for SARS was 10%, and for MERS it was 34% estimated. In Wuhan, it has affected around 59.5% and 40.5 %, females. As of 12th may 2020, the ministry of Public health has announced more than 5000confirmed cases, and more than130 deaths reported ofCovid-19 identifies in Afghanistan, and there are many more cases that are unidentified. The minimal population lives in cities in Afghanistan, and there is very rough terrain that for someone, it will tough to reach at household level in remote areas. Surveys from the past show that there are limited facilities compare to the developing countries; Afghanistan just has 200 ventilators and one bed/ 2000 patients, which is an unimaginable condition. Most of the patients died had previous chronic health conditions such as blood pressure or chronic kidney diseases not only in Afghanistan but all over the world.

Introduction

Afghanistan is a country which is dealing simultaneously with Coronavirus and insecurity and political rivalry among elected leaders as a fallout of election 2019. The Covid-19 is a hidden enemy and has spread exponentially to date and has taken the lives of innocent people all over the world as a reference to the current context in more than200 countries. If we flashback the history of Diseases turning the pages so to identify the past, which shows Coronaviruses (Covid-19) be identified as human pathogens for various pandemics in the world since early the 1960s. Coronaviruses infect humans and many other vertebrates such as bats and camels; it can transmit from one human being to another very quickly via touching and respiratory systems droplets. A recent report published by CNN news states, Covid-19, where it was found in human semen as well. There are assumptions about Covid-19 via sexual intercourse. The range of infections varies from person to person and regions to regions. Covid-19 illness in humansismostly infecting respiratory systems such as lungs or gastrointestinal tracks and causes diarrhea in adults. However, symptoms can range from the common cold to more severe lower respiratory tract infections such as Pneumonia followed by body pain, dry cough with tiredness, frequent headache, which could be confused with, unlike typical normal situations. A broad range of coronaviruses is found in bats, which might play a crucial role in the virus evolution of alpha- and beta coronavirus lineages in particular. However, other animal species (in case of Covid-19, it is yet to be identified, and these may be multiple species of bats) can also act as an intermediate host and animal reservoir.

Human has faced lethal viruses in the past two decades, three zoonotic coronaviruses have been identified as the cause of large-scale disease outbreaks–Severe Acute Respiratory Syndrome (SARS) in 2003, Middle East Respiratory Syndrome (MERS) since 2012 and the total number of reported infected cases was 2519 patients, with a fatality rate of 866 cases (34.3%).,80% of the MERS cases were in Saudi Arabia and the most common host of the virus is dromedary camel, and Swine Acute Diarrhea Syndrome (SADS). In 2014-2016 there was another deadly virus epidemic hit and caused severe economic crises in the African countries by the name of Ebola Virus Disease (EVD). SARS and MERS emerged in 2003 and 2012, respectively, and caused a worldwide pandemic that claimed thousands of human lives, while SADS struck the swine industry in 2017. (Factsheet for health professionals on Coronaviruses 2020).

The incubation period for Covid-19 is around 2-14 days. The probability of death increases as age increase for Coronavirus, and it has a synergic relationship if the Covid-19 has pre-health conditions. The lab findings are mostly lymphopenia and Pneumonia in radiographic findings. Covid-19 was endemic and later became pandemic. People with bone marrow transplant, Herat disease, or immune suppressed mechanisms such as steroids particular hydro-steroids are more vulnerable to be affected by Covid-19.(Neph Cure Kidney International, 2020). Covid-19 could be fatal, and there are four stages of the disease outbreak, which is 1- the initial appearance of the Disease, 2- Local transmission of the Disease, 3- Community transmission of the Disease, 4- widespread outbreak or pandemic.

Coronavirus attacks on heart a causes myocarditis, the heart is already weakened by high blood pressure, and arteries are weakened, so there is less possibility that the heart would pump oxygen-carrying blood to the body organs . The recent Covid-19 outbreak in Wuhan has caused several respiratory diseases in human beings. Common signs are breathing difficulty, infection, kindly failure. It is Zoonotic diseases like SARS and MERS in the past few years. It is now a public health emergency in most under and developed countries.

Coronavirus (Covid-19) was classified as a pandemic by the WHO. It has been cautioned till date that to help stop the virus spreading everyone should practice good hygiene including washing your hands regularly, using a tissue or whatever is the best source available based on regions and countries (N95 masks which are recommended by CDC and WHO), covering the mouth or possibly T region of the face in most cases when you cough or sneeze and finally avoiding close contact via social distancing. (https://www.facebook.com/KidneyHealthAust, 2019) Since there is no vaccine to prevent the current coronavirus disease. The best Coronavirus prevention is to avoid being exposed to the Covid-19 virus. Doctors and the CDC recommend following everyday preventive actions to help prevent the spread of respiratory diseases like the Coronavirus and to lower your risk of exposure. Trails are going on, and according to various researches and health institutions, it may take up to weeks and months to make them available for public administrations.Covid-19 is from Coronavirus and usually popular for flue in humans however the Covid-19 is responsible for causing Pneumonia and lower respiratory tracks infections in human being, there are very similar to the flu, fever, cough, and shortness of the breath. There is minimal information available like pathogenic. Many patience has fever and cough, and some may have severe signs and symptoms. Immuno-compromised patients are more prone to be affected by Covid-19. Washing hands is a more effective way to control sickness, as it destroys the attaching receptors with the host cell on virus body

Background and Study methodology

This research utilizes the desk review and evaluation of various previous written papers and data available be online on Covid-19 outbreaks in multiple countries and Afghanistan. Since the outbreak of the virus was in Wuhan, China and the infection spread all over the world in the next few weeks after cases have been identified. The primary source of that literature review was news channels which are actively reporting the news of Covid-19. The background of the intention to write such an article is that the author's family has a genetic disorder, and already two members have been passed away due to polycystic kidney disease at the age of 39 and 41. There were very few options available for kidney transplantation and further continuation on dialysis. There is some limitation in this study such as there is need for further extensive such as cohort study that would give perfect results for future readers and people and families suffering for such medical condition. That type of research needs institutional support. The literature review part covers the detailed and comprehensive review of the medical condition, such as Polycystic kidney disease (PCKD). Other chronic medical conditions have not judged, or research has not been considered for this particular article, but the comparisons and effects of the previous Coronavirus have been given for references due to the less data availability

Literature review

PCKD is an inherited disease with the formation of millions of cysts in the kidneys. In children, it is Autosomal dominant PCKD and Autosomal recessive PCKD. The autosomal dominant one is more common12-

13 million people worldwide. There are different types of gene mutation PCKD-1, and PCKD-2 major signs are kidney expansion, and producing progressive kidney enlargement causes unilateral, bilateral kindly failure. These cysts are filled with body and could move to other body parts such as the liver. The kidney has several roles with a major one is filter action through nephrons. PCKD has an impact on activities such as impaired filtration, absorption, excretion, which are direct or primary symptoms. Secondary symptoms are hypertension and change in blood and urine parameters such as blood urea and nitrogen.

Polycystic kidney disease (PCKD) is agenetically inherited disease that causes millions of cysts in the unilateral or bilateral kidneys cysts formation in the kidneys. Cysts, which are sacs filled with fluid, grow in the kidneys and causes them to enlarge, and there are possibilities of rupture if care is not taken. Children have a 50% chance of developing PCKD if one parent carries the gene. If a person has the PCKD gene, he or she will have some form of the Disease in their lifetime. There is also a rare form of PCKD, called autosomal recessive polycystic kidney disease that affects newborns, infants, and children. This form of PCKD can cause death in the first month of life. There are often no symptoms in the early stages of PCKD, like till the age of 30. The early signs could be pain like sensation unilaterally or bilaterally. High blood pressure and blood in urine could occur. Most symptoms appear in middle age. The first symptom is often a pain in the back or side. Other signs of PCKD include at the various stage are as follows:

- Abnormal kidney enlargement
- Hypertension (140/100 mmHg)
- Abdominal kidney pain and high protein in the urine
- Frequent urination and blood in urine at some stages are common.
- Development of calculi and stones of various sizes. Source: (UVA Health, 2020)

There is a deep relationship between Covid-19 patients and PCKD patients. Covid-19 can cause permanent damage to the kidneys, lungs, heart and may cause secondary bacterial infections. The strange thing is that these complications may get severe, and many illnesses may develop once the person has got the Covid-19. Covid-19 may cause kindly damage by 30% of patients admitted to the hospitals in the US and China. The current advice is that anyone with chronic kidney disease should be particularly stringent in following social distancing measures. There is a possibility that the kidney also has receptors, and the Covid-19 may be attached to these receptors and may multiply. These receptors are also found on the lungs and heart for human beings. The low level of oxygen in the blood may cause kidneys to malfunction and may lead to kidney failure. Once the virus is in the body, there active cells create cytokines, which are small proteins in nature, and these proteins may cause inflammation in the body, and these inflammatory reactions can also damage normal body tissues such as kidney cells.

The complex immune reaction may lead to sepsis syndrome, and the inflammatory response may impact the multiple organ systems in the body. The vital organs such as the heart, lungs, kidneys, and liver functions are interdependent, so if one is damaged, it may impact another organ. The Covid-19 may cause small and tiny blood clots in the body since the function of the kidneys is to filter the abnormal fluids and toxins from the body; thus, Covid-19 may cause kindly functional impairment. The advice for people who fall into any of the above categories, including PCKD, is to stringently follow the social distancing measures, not to self-isolate unless you have Covid-19symptoms. (Coronavirus (Covid-19) guidance for patients with kidney disease 2020). In figure 1 it is shown that the population has been divided into various age groups and research has been conducted and rests are displayed. The data visualization sclearly show that most of the cases are tested positive in the age group of 50-59 and if we compare to see the impacts of the PCKD on the kidneys are more fatal in same age category which is a clear indication that PCKD patients are more prone to have a kindly failure of renal impartment since the patients can't take medications on their own due to filtrations issues by kidney as it will cause more work by the kidneys to be done.

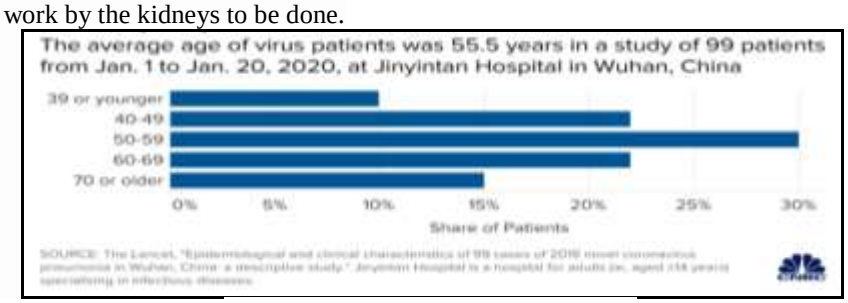

Figure 1Covid-19 and age relationship

The damage to the kidneys due to Covid-19 is irreversible in many cases. Kidney involvement seems to be frequent in patients with Covid-19. Proteinuria (and blood in urine) often occur at the beginning or during the infection, a few patients even develop acute kidney injury (AKI). This shows that Covid-19 also attacks the kidneys. Nephrologists from all countries are dedicated and committed to helping these patients. Given the involvement of kidneys during coronavirus infection, patients should also be monitored after the Disease. Kidney involvement seems to be frequent in people who have been tested positive, admitted to the hospitals, and have developed advanced signs and symptoms.

The signs and symptoms appear in the infected body from day 2 and they may reach the peak until week 2.The signs and symptoms may vary from patient to patient such as so far people admitted in the hospitals due to Covid-19 70% people with no fever,68-83% had a cough, and 11-40% of people had reported breathing issues. The other sings are confusion, nausea, and headache. Soon after getting Covid-19 difficulty in breathing may appear after 5thto 8th day. Comparative studies show that a high rate of renal abnormalities in corona-positive patients: Admitted to hospital, 34% of the 59 patients have developed massively elevated levels of albumin in the urine (proteinuria), a symptom of kidney damage 63% of the study patients developed proteinuria while in hospital, and many of them also had blood loss in their urine (hematuria) and 27% had kidney failure. The findings of these studies were supported by a second study involving 710 hospitalized patients: On admission, 44% had hematuria and proteinuria (26.7% had hematuria only), and kidney function decreased in nearly 15%. (Are Kidneys Targeted by the Novel Coronavirus 2020).

Coronavirus Disease 2019 (Covid-19) is thought to spread mainly from person-to-person contact or physical contact. Children with the age of nine or bellow have less possibility to develop severe symptoms they may have mild symptoms. Older adults and people with serious chronic medical conditions, including kidney disease, seem to be at higher risk for more serious illness. Therefore, people with PKD need to take action to reduce your risk of exposure. ""("Coronavirus and PKD: What you need to know"","2016).

If you are at higher risk of getting very sick from Coronavirus, you should:

- Good to take regular medications suggested by authorized medical specialists
- Using a protective measure while traveling in open and public places
- Perform blood tests for various parameters and important indicators for safety
- Stay inside a homein case of having symptoms such as fever, or flue or a mild case of cough, sore throat, body aches, headache, chills
- Follow on certain medical assistant therapies such as dialysis for kidney patients, it should not be missed.
- Wash hands often with soap and water for at least 20 seconds; If sops are not available to go for plan B and try to use hand sanitizer with 60%-95% alcohol.
- Avoid frequently touching your face, especially your nose and mouth which is usually called as T-area

(Be Prepared: Kidney Patient Prep for Coronavirus 2020).

Covid-19 also impacts the psychology of aged people above 60 and 65 years old. Since there was no quarantine the aged and people with chronic diseases would go out for a walk or perform certain exercises but during quarantine their activities are limited and it has also contributed to the psychological impacts and thus on the health of the patients. People with chronic kidney disease stage 3, 4, or 5 are thought to be more likely to get severe symptoms from Covid-19 than people with normal kidney function. The lower your kidney function, the higher the risk that Covid-19 poses to you. People who have had a transplant or are receiving dialysis are likely to be at increased risk from Covid-19. Most people recover from Covid-19 without specific treatment. However, people who are elderly or have underlying health conditions (such as Asthma, diabetes, heart disease, or chronic kidney disease) may be more likely to get severely ill from Covid-19 than other people.(Bridges, 2020). Acute renal impairment was uncommon in SARS but carried high mortality. Acute renal impairment is likely to be related to multi-organ failure. (Chu et al., 2005). Another study shows that the risk factors for severe illness are not yet clear, although older patients and those with chronic medical conditions may be at higher risk for severe illness. Among more than 44,000 confirmed cases of Covid-19 in China since the outbreak until the second moth are presented here. Most occurred among patients aged 30–69 years (77.8%), and approximately 19% were severely or critically ill. The case-fatality proportion among cases aged more than 60 years was: 60-69 years: 3.6%; 70-79 years: 8%; ≥80 years: 14.8%. Patients who reported no underlying medical conditions had an overall case fatality of 0.9%, but case fatality was higher for patients with comorbidities: 10.5% for those with the circulatory Disease, 7% for diabetes, and 6% each for chronic breathing illness, hypertension, and cancer. Hypertension is defined as readings (130/80 mmHg) or above. Data from Wuhan also shows that the death rate in Covid-19 patients with hypertension was more than 6%. Case fatality for patients who developed breathing

failure, septic shock, or multiple organ dysfunction was 49%. (CDC, 2020).The possible causes could be the interrelationship of the body organs' functions.

COVID-19 Fatality Rate by Age:

*Death Rate = (number of deaths/number of cases) = probability of dying if infected by the virus (%). The percentages shown below do not have to add up to 100%, as they do NOT represent a share of deaths by age group. Rather, it represents, for a person in a given age group, the risk of dying if infected with COVID-19.

AGE	DEATH RATE confirmed cases	DEATH RATE all cases
80+ years old	**21.9%**	**14.8%**
70-79 years old		**8.0%**
60-69 years old		**3.6%**
50-59 years old		**1.3%**
40-49 years old		**0.4%**
30-39 years old		**0.2%**
20-29 years old		**0.2%**
10-19 years old		**0.2%**
0-9 years old		**no fatalities**

Figure 2COVID-19 Fatality Rate by Age:

Source: ("Coronavirus Age, Sex, Demographics (Covid-19) - Worldometer," 2019).Covid-19 Fatality Rate by COMORBIDITY:

*Death Rate = (number of deaths/number of cases) = probability of dying if infected by the virus (%). Pre-existing conditions may change the probability. Rather, it represents, for a patient with a given pre-existing condition, the risk of dying if infected by COVID-19.

PRE-EXISTING CONDITION	DEATH RATE confirmed cases	DEATH RATE all cases
Cardiovascular disease	**13.2%**	**10.5%**
Diabetes	**9.2%**	**7.3%**
Chronic respiratory disease	**8.0%**	**6.3%**
Hypertension	**8.4%**	**6.0%**
Cancer	**7.6%**	**5.6%**
no pre-existing conditions		**0.9%**

*Death Rate = (number of deaths / number of cases) = probability of dying if infected by the virus (%). The percentages do not have to add up to 100%, as they do NOT represent share of deaths by condition.

Figure 3 relationship betweenCovid-19 and other Diseases

Source: (Coronavirus Age, Sex, Demographics (Covid-19) - Worldometer, 2019).

Previous pandemics Disease severity has been linked to patient health status, as people with chronic diseases or an immune compromised state fare worse, although the mechanisms of Disease have yet to be elucidated. Despite increased viral replication, pathology in the lungs was significantly lower in immune suppressed

animals. (Prescott et al., 2018). SARS was originated in China too in 2003 for which WHO had made a global alert, and it was transmitted through air transport. More people died because they could not mount a good immune response .The total people infected were 8439, and 21% of these people were health workers. The total number of deaths was 812, with a case fatality rate of 9.6%. The mode of transmission was mainly body droplets. The average incubation period was five days and people with premedication conditions were more prone, as shown in figure (5). Scientists say they now understand how humans can fight off and recover from Covid-19. Research shows that Eight out of 10 people who contract Coronavirus will have mild to moderate symptoms. Scientists are hoping to use markers in the blood to screen patients to see if they are likely to develop more severe symptoms."(Scott 2020). Compare to the SARS and MERS the Covid-19 is more infections and transmit faster. SARS has the same male to female ratio according to the epidemiologists. MERS has affected males more than females. The rate was 65% males and 35 females.

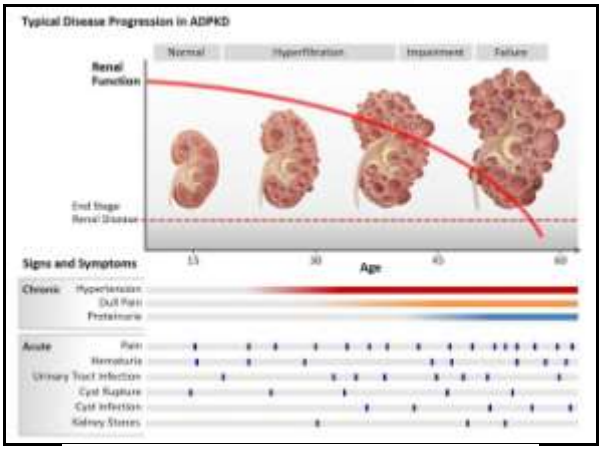

Figure 4 Typical PCKS diseases progression

Figure 5 SARS-CoV-2 mortality rate after previous illness

Source: WHO 2020

Diagnosis of the Covid-19 is made via using Real-time reverse transcriptase-polymerase chain reaction (RT-PCR), which uses the test samples from the upper and lower respiratory tract.

Covid-19 and Public Health

There is no known cure for PCKD and as well as for Covid-19 up until now in the world. Countries are fighting to recover the cases by injection virus types of medication and serums and antibodies to cure Covid-19 patients. In adults, the untreated Disease can be rapidly fatal or continue to progress slowly shown in figure (4), even after symptoms of kidney failure appear. About half of all adults with PCKD also develop kidney failure. Unless the patient undergoes dialysis or has a kidney transplant, this condition usually leads to death within four years of diagnosis. The best way to perform operational and kidney transplants to fix problems such as laparoscopy. There are two preventive interventions, primary and secondary. Specifically, primary prevention of kidney disease requires the reform of risk factors, including diabetes mellitus and hypertension, unhealthy diets, structural irregularities of the kidney and urinary tracts, and or nephro toxicity levels. If we consider the studies conducted on the relationship between Covid-19 and PCKD, within two months, Covid-19, a previously unknown coronavirus, has raced around the globe, infecting over four million people with numbers continuing to rise quickly. Effective countermeasures require helpful tools to monitor the viral spread and understand how the immune system responds to the virus. Some discussions and predictions by Afghanistan health authorities is given in the bellow figure (6)

	Most likely scenario	Minimum scenario	Maximum scenario
Pandemic impact/attack rate	25%	15%	35%
Total hospital Admission	58,844	18,018	100,184
Total deaths	9,162	3,430	21,508

Figure 6 Best and worst-case scenarios for Covid-19 in Afghanistan

For figure 6, the maximum 12 weeks duration for a pandemic of Covid-19 and even if we consider the most likely scenarios, there are chances of 9000 plus deaths, which is devastating. There is a deep relationship between the Covid-19 and PCKD or any other chronic disease patients. PCKD patients are more prone to normal human beings to be affected by Covid-19. One of the functions of the kidneys is to maintain the blood pressure along with filtration once the kidney tissues are damaged, it causes hypertension and leads to weakening the main pump organs. Covid-19 uses this as an opportunity to weaken the multiple organ systems. There is a need for strong precautions to be taken by PCKD or people with chronic illnesses.

Conclusions and recommendations

The world has raised its concerns to have more viable practices to save or minimize the pathogenesis and contamination of Covid-19. As a result every country is in crisis to cope with the Coronavirus. The Coronavirus cause for economical and health crises in developing countries such as Afghanistan which has a terrible health system. The Afghanistan economy and health systems are dependent on the foreign Aid is in millions has been given to the health system and many more has to come. There is no doubt that people live under the poverty line and figures are more than 60% for Afghanistan according to WHO and World Food Program (WFP) survey in recent years. The lifestyle of Afghanistan people is more like a sedentary and there is only one breadwinner that has affected the overall lifespan and age of all groups. The initial response for Coronavirus by the Afghan government was very poor and it took longer by health authorities and other institutions to take initiates and come up with useful remedies to ameliorate the impacts of the Covid-19 in initial weeks. There are more than four main doctors among the dead people because of Coronavirus in 1st month on the outbreak. There were health warnings given by the international community and institutions working in the field of the outbreak response team to give health alarms for aged and older people but still, issues continue and the idea was ignored by various population groups due to lack of awareness. The major figureheads, such as religious groups in various provinces, gather people for prayers and other rituals to fight againstCovid-19. It is paramount to find the proper solution along with the help of the international community and apply the best tactics that other countries such as New Zealand and China used to contain the virus outbreak. The Afghan government needs to address the governing bodies such as Municipality and Public health, provincial governmental bodies, ministry of interiors affairs to introduce new laws on local level to run the country. These Government institutions are already working to quarantine measures application but at some point they have failed since the quarantine the cases of Covid-19increased alarmingly There is no specific treatment; current treatment regimens are supportive type and symptomatic.

World health authorities have kind of eliminated SARS and MERS can be caused in the world if precautions are not taken properly. We are living in the age of global public health emergency era and there is more to come coming days. Covid-19 is an infection and a very dangerous infectious disease. There are only 7 coronaviruses that can causes diseases in human beings. There are predictions with worse and best-case scenarios that how many people in Afghanistan are likely to affect by Covid-19. PCKD is a multisystem disorder and The patients need to get good health care and control their blood pressure and other body parameters monitored. Some patients may progress and age about 60 years old and above may get benefit from treatments in case of immune suppression's. There are various ways that Covid-19 can take the lives of people with PCKD or nay chronic diseases. Below given are some practiced precautions and guidelines for PCKD patients to reduce the risk factors to be suffered from Covid-19 in the future

- Practice physical and social distancing by staying indoors, washing hands with quality soaps (if there is no soap, use hand sanitizer with 60-95% alcohol.) based on principles suggested by WHO and CDC
- Take extra measures and follow the World health organization guidelines to control and prevent the Covid-19 spread such as taking the recommended amount of Vitamin C and D
- Avoid medications such as nonsteroidal inflammatory drugs (NSAIDs) such as ibuprofen and naproxen. These medications may increase blood pressure and put more pressure on kidneys.
- Stay health-focused Get plenty of rest and sleep, eat a nutritious and balanced diet, stay hydrated, and get regular exercise. Managing stress could be another pathway to stop the worse impact of the Covid-19
- Follow up with radiologists and nephrologists at least every 3 months to have a look at the blood parameters and kidney conditions evaluated.

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